
	Division of Environmental Health and Communicable Disease Prevention	
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Yersiniosis

Fact Sheet

Record of Investigation of Enteric Infection (CD-2C) rev. 6/02

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Yersiniosis

Overview ^(1,2)

For a more complete description of yersiniosis, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.

Case Definition ⁽³⁾

Clinical description:

An acute bacterial enteric disease typically manifested by acute febrile diarrhea (especially in young children), enterocolitis, acute mesenteric lymphadenitis mimicking appendicitis (especially in older children and adults), complicated in some cases by erythema nodosum (in about 10% of adults, particularly women), postinfectious arthritis and systemic infection; caused by either of two agents, *Yersinia enterocolitica* or *Y. pseudotuberculosis*. *Y. enterocolitica* infections present more commonly with a gastroenterocolitis syndrome, and *Y. pseudotuberculosis* with abdominal pain. Bloody diarrhea is seen in 10%-30% of *Y. enterocolitica*-infected children; joint pain is reported in half of infected adults⁽¹⁾.

Laboratory criteria for diagnosis:

Diagnosis is usually made by stool culture. *Yersinia* can be isolated from blood with standard commercial blood culture media. Serologic diagnosis is possible by an agglutination test or by ELISA, but its availability is generally limited to research settings.


Case classification:

Confirmed: a case that is laboratory confirmed.

Probable: a clinically compatible case that is epidemiologically linked to a confirmed case.

Information Needed for Investigation

- **Verify the diagnosis.** What laboratory tests were conducted and what were the results?
- **When investigating gastrointestinal illness of unknown etiology,** see “Outbreak Investigation, Acute Gastroenteritis” in this Manual.
- **Establish the extent of illness.** Determine if household or other close contacts are, or have been, ill by contacting the health care provider, patient or family member.

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- **Contact the Regional Communicable Disease Coordinator**, if an outbreak is suspected, or if cases are in high-risk settings or jobs such as food handlers, child care, or health care.
- **Contact the Bureau of Child Care**, if cases are associated with a child care facility.

Case/Contact Follow Up And Control Measures

Determine the source of infection:

- Does the case live in a household where pork intestines, i.e., chitterlings, are prepared?
- Does the case or a member of the case's household attend a child care center or nursery school?
- Does the case or a member of the case's household work as a food handler or health care provider?
- Has the case traveled to an endemic area?
- Does the case work in animal operations or processing?
- Have there been other cases linked by time, place or person?

Control Measures


See the Control of Communicable Diseases Manual, Yersiniosis, "Methods of control."

See the Red Book, *Yersinia enterocolitica* and *Yersinia pseudotuberculosis* Infections, "Control Measures."

General:

- Infected persons must be made aware of the importance of good handwashing.^(1,2)
- Ill contacts of yersiniosis patients should be excluded from food handling, child care or patient care until diarrhea ceases and they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.⁽¹⁾
- Because secondary transmission is rare, the search for unrecognized mild cases and convalescent carriers is indicated only when a common source exposure is suspected.
- Cultures of contacts should generally be confined to people employed in occupations likely to expose a large number of people and other situations where the spread of infection is particularly likely.
- Antibiotic therapy can reduce the duration of excretion of the organism in the stool.

Food Handlers and Health Care Personnel:


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- When a foodhandler or health care worker is diagnosed with yersiniosis, contact the Regional Communicable Disease Coordinator and the appropriate Environmental Public Health Specialist *immediately*.
- Cases and ill contacts (symptomatic with diarrhea) of yersiniosis patients should be excluded from foodhandling or patient care until diarrhea ceases and they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.⁽¹⁾

Child Care Employees and Attendees:

- When a yersiniosis case is identified in a child or employee of a child care facility, contact the Regional Communicable Disease Coordinator and the Bureau of Child Care *immediately*.
- Outbreaks of *Yersinia* infection are unusual in child care programs; however, educating child care attendants and the children on the importance of handwashing is key to preventing yersiniosis.
- All rules and guidelines regarding handwashing, toileting, diapering, and food handling, referenced in Licensing Rules for Group Day Care Homes and Child Day Care Centers ⁽⁶⁾ should be followed rigorously.
- Contact the Bureau of Child Care for the Environmental Public Health Specialist to perform an assessment of the child care facility.
- If preferred, the parent(s) may provide formulas and special baby foods if each individual container is labeled to identify the child receiving the formula/foods.
- All children and staff who have diarrhea should be excluded from attendance until 24 hours after their diarrhea ceases.
- When yersiniosis is identified in a child care attendee or staff member, stool specimens from other symptomatic attendees and staff members should be cultured.
- Stool specimens from household contacts who have diarrhea also should be cultured.⁽²⁾
- Cases with known (culture confirmed) yersiniosis should not provide child care or handle food until they are approved to return to work by either the local health department or the Missouri Department of Health and Senior Services.
- To prevent spread of the infection, efforts should be made to prevent the transfer of children to other child care centers. Closure of affected child care centers may lead to placement of infected children in other centers (with subsequent transmission in those centers) and is counterproductive.

Laboratory Procedures

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Specimens:

Enteric specimens:

Collect clinical specimens in Cary-Blair media using the enteric specimen collection kit supplied by the State Public Health Laboratory (SPHL). Specimens should be shipped chilled. Diagnosis is based on culture of the organism. The only clinical specimen the SPHL will test for yersiniosis is stool. The SPHL will identify yersinia from cultures submitted by other laboratories. For epidemiological purposes, the cultured organism should be tested further to determine species. The SPHL does this testing at no charge to the submitter. Special arrangements need to be made in advance with the enteric microbiology section prior to submitting specimens.

Environmental specimens:

SPHL can perform testing on food and other specimens that are linked to clinical specimens. Food should be refrigerated, *but not frozen*. Contact the environmental microbiology section prior to collecting and submitting the specimens for guidance.

Additional information on laboratory procedures can be obtained from the Regional Communicable Disease Coordinator or from the SPHL web site at:

<http://www.dhss.state.mo.us/Lab/index.htm>. (8 May 2003)


Reporting Requirements

Yersinia enterocolitica is a Category II reportable disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within three days of first knowledge or suspicion by telephone, facsimile, or rapid communication.

1. For confirmed and probable cases, complete a "Disease Case Report" (CD-1), and a "Record of Investigation of Enteric Infection" (CD-2C) revised 6/02.
2. Entry of the completed CD-1 into the MOHSIS database negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
3. Send the completed secondary investigation form(s) to the Regional Health Office.
4. All outbreaks or "suspected" outbreaks must be reported as soon as possible (by phone, fax or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
5. Within 90 days from the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

References

1. Chin, James, ed. "Yersiniosis." Control of Communicable Diseases Manual, 17th ed. Washington, DC: American Public Health Association, 2000: 558-561.

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2. American Academy of Pediatrics. “*Yersinia enterocolitica* and *Yersinia pseudotuberculosis* Infections.” In: Pickering, LK, ed. 2000 Red Book: Report of the Committee on Infectious Diseases. 25th ed. Elk Grove Village, IL. 2000: 642-643.
3. Evans, AS and Brachman, PS, ed. Bacterial Infections of Humans Epidemiology and Control, 3rd Ed. New York: Plenum, 1998.
4. Donowitz, LG, Infection Control in the Child Care Center and Preschool, 4th Edition, 1999: pages 315-318.
5. Mandell, GL, Bennett, JE, and Dolin, R, ed. Mandell Douglas and Bennett’s Principles and Practice of Infectious Diseases, 4th ed. New York: Churchill Livingstone, 1995.
6. Missouri Department of Health and Senior Services. 19 CSR 30-62-Health. Chapter 62- Licensing Rules for Group Day Care Homes and Child Day Care Centers. <http://www.sos.state.mo.us/adrules/csr/current/19csr/19c30-62.pdf>. (8 May 2003)

Other Sources of Information

1. North Carolina State University, North Carolina Cooperative Extension Service, Gateway to Food Safety Information-an entire website of links devoted to *yersinia enterocolitica*. <http://www.ces.ncsu.edu/depts/foodsci/agentinfo/org/yersinia.html>. (8 May 2003)
2. The Merck Veterinary Manual. 8th Ed. Ed. Susan E. Aiello. Whitehouse Station, NJ: Merck & Co., Inc., 1998: 114-115, 259-162, 2162, 2166. <http://www.merckvetmanual.com/mvm/index.jsp> (search “yersinia”). (8 May 2003)

Yersiniosis

FACT SHEET

What is yersiniosis?

Yersiniosis is an acute infection of the intestinal tract caused by either of two bacteria, *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*. In Missouri, from 1997 to 2001, there was an average of 19.4 cases of yersiniosis each year.

Who gets yersiniosis?

Anyone can get yersiniosis. However, most cases caused by *Yersinia enterocolitica* occur in infants and young children, while *Yersinia pseudotuberculosis* mostly affects persons aged 5 to 20 years.

How is yersiniosis spread?

Yersiniosis is spread by contaminated food or water, or from infected people or animals. Raw pork and pork products, especially pork intestines, i.e., chitterlings, are often contaminated.

Where are the *Yersinia* bacteria found?

Animals are the main source of *Yersinia*. Fecal waste from animals may contaminate water, milk, and foods and become a source of infection for people or other animals. The bacteria has been found in cold cuts, pork chitterlings, raw milk, ice cream, improperly processed milk, tofu, shellfish, lakes and streams, and both wild and domestic animals.

What are the symptoms of yersiniosis?

People infected with *Yersinia* bacteria may have diarrhea, with fever and abdominal discomfort. Children may have bloody diarrhea, and adults commonly experience joint pain. Persons five years of age and older may have symptoms that mimic appendicitis.

How soon after infection do symptoms appear?

Symptoms usually appear within three to seven days after exposure.

How is yersiniosis diagnosed?

Yersiniosis is diagnosed by identifying the *Yersinia* bacterium in the blood or stool (feces).

How is yersiniosis treated?

Yersiniosis may be treated with antibiotics. Consult your physician for treatment. *Yersinia* is generally resistant to penicillin.

Should infected people be excluded from school or work?

People with diarrhea need to be excluded from child care, food service or any other group activity where they may present a risk to others. Most infected people may return to work or school when their diarrhea stops if they carefully wash their hands after using the restroom. Foodhandlers, children, and staff in child care settings, and health care workers must obtain the approval of the local or state health department before returning to their routine activities.

How can yersiniosis be prevented?

- The single most important way to prevent the spread of disease is careful handwashing. Wash hands thoroughly:
 - After use of restroom.
 - Before preparation of foods.
 - After handling raw meat.
 - After completion of food preparation.
 - After handling animals or their feces.
- Thoroughly cook all foodstuffs derived from animal sources.
- Avoid using raw milk.
- Refrigerate foods promptly; don't hold at room temperature any longer than necessary.
- Wash cutting boards, utensils and food preparation counters with soap and water immediately after use.
- Make sure that the correct internal cooking temperature is reached. The correct temperature is 160 degrees Fahrenheit for beef and pork, and 185 degrees Fahrenheit for poultry.
- Prevent cross-contamination. Never let raw meat or their juices, especially pork or pork products, come in contact with cooked meat or any other food, raw or cooked.

**Missouri Department of Health and Senior Services
Section for Communicable Disease Prevention
Phone: (866) 628-9891 or 573-751-6113**



MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES
SECTION OF COMMUNICABLE DISEASE CONTROL AND VETERINARY PUBLIC HEALTH
RECORD OF INVESTIGATION OF ENTERIC ILLNESS

MOHSIS CID#

Information with shaded titles is not required if entered on the CD-1 report or entered into MOHSIS.

NAME: (LAST, FIRST, MI)		DATE OF BIRTH:	AGE:	GENDER:	RACE:
		/ /			
PARENT(S) NAME IF NOT ADULT:		PHONE NO.:			
HOME ADDRESS:	CITY:	STATE:	ZIP CODE:	COUNTY:	

EMPLOYMENT / CHILD CARE (*See reverse side for High-Risk Employment information.)

PLACE OF EMPLOYMENT:	ADDRESS:	PHONE NO.:	
OCCUPATION:	JOB DUTIES:		
SCHOOL / CHILD CARE ATTENDED:	GRADE OR ROOM:		
SCHOOL / CHILD CARE ADDRESS:	CITY:	STATE:	ZIP CODE:

Symptoms:* (Check Yes or No and number the order in which symptoms first presented)

ORDER NO.	SYMPTOM	YES	NO	ORDER NO.	SYMPTOM	YES	NO	ORDER NO.	SYMPTOM	YES	NO
	Nausea	<input type="checkbox"/>	<input type="checkbox"/>		Bloody Diarrhea	<input type="checkbox"/>	<input type="checkbox"/>		Malaise	<input type="checkbox"/>	<input type="checkbox"/>
	Vomiting	<input type="checkbox"/>	<input type="checkbox"/>		Cramps	<input type="checkbox"/>	<input type="checkbox"/>		Headache	<input type="checkbox"/>	<input type="checkbox"/>
	Diarrhea	<input type="checkbox"/>	<input type="checkbox"/>		Chills	<input type="checkbox"/>	<input type="checkbox"/>		Dizziness	<input type="checkbox"/>	<input type="checkbox"/>
	Watery Diarrhea	<input type="checkbox"/>	<input type="checkbox"/>		Fever _____ °	<input type="checkbox"/>	<input type="checkbox"/>		Other		

Disease

DIAGNOSIS:	ONSET DATE / TIME:*	DURATION OF SYMPTOMS:	
	/ / _____ <input type="checkbox"/> am <input type="checkbox"/> pm	_____ hrs.	
INCUBATION PERIOD:*	PHYSICIAN CONSULTED?	DATE:	HOSPITALIZED?
	<input type="checkbox"/> Yes <input type="checkbox"/> No	/ /	<input type="checkbox"/> Yes <input type="checkbox"/> No
PROVIDER NAME:	CITY:	STATE:	PHONE NO.:
TREATMENT: (TYPE, AMOUNT)			DATE:*
			/ /
<input type="checkbox"/> Recovered <input type="checkbox"/> Died	DATE OF DEATH:	CAUSE OF DEATH:	
	/ /		

Patient History (Limit patient responses to within one disease incubation period.)


TRAVEL: (OUTSIDE OF HOME COMMUNITY)	DATE(S):*	LOCATION(S):
<input type="checkbox"/> Yes <input type="checkbox"/> No		
HOME WATER SUPPLY:		
<input type="checkbox"/> Private (type) _____ <input type="checkbox"/> Bottled Water (brand) _____		
<input type="checkbox"/> Public Water District (Name) _____ Other water sources: _____		
HOME SEWAGE DISPOSAL SYSTEM:		
<input type="checkbox"/> Private (type) _____ <input type="checkbox"/> Community System (Name) _____		
RECREATIONAL WATER CONTACT: (SWIMMING POOL, LAKE, RIVER, ETC.)		
<input type="checkbox"/> Yes <input type="checkbox"/> No Type: _____ Location: _____		
Dates: _____		
PET / ANIMAL EXPOSURE: (DOMESTIC PETS, LIVESTOCK, OTHER)		
<input type="checkbox"/> Yes <input type="checkbox"/> No Pets/Animals ill: <input type="checkbox"/> Yes <input type="checkbox"/> No Animal Type(s): _____		
Date(s)* of Animal Exposure: _____		
Describe Animal Exposure: _____		
Location of Animal Exposure: _____		
Comments: _____		

Food**

	NAME	STREET ADDRESS	CITY / STATE
Grocery stores routinely used:	_____	_____	_____
	_____	_____	_____
Restaurants routinely used:	_____	_____	_____
	_____	_____	_____
OTHER FOOD SOURCES: (e.g., ETHNIC, UNPASTEURIZED, HOME CANNED)		TYPE / LOCATION:	

* Epi Calendar (reverse side) may be used to help determine time periods.
** Attach separate 3-day food history if multiple cases are known/suspected.

Please submit this form along with completed CD-1 Report on all enteric cases.

Laboratory Tests*: Record Diagnostic Information in Section 41 of CD-1 Report and/or attach copy of lab slip(s)										
Are there other associated cases? <input type="checkbox"/> Yes <input type="checkbox"/> No					If yes, how many?		How Associated:			
List ill contacts:										
NAME & ADDRESS	DOB / AGE	SEX	RELATION TO PATIENT	SIMILAR ILLNESS		ONSET DATE	LAB CONFIRMED		CD-1 AND ENTERIC FORM COMPLETED	
				YES	NO		YES	NO	YES	NO
				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Risk Employment Information (e.g., Food Handler, Child Care or Health Care Worker)										
SPECIFIC JOB DUTIES:*										
DATE(S) WORKED PRIOR TO ONSET OF ILLNESS:*						EXCLUDED FROM WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No		DATE:*/ / /		
IF YES, BY WHOM:					TITLE:					
FOLLOW-UP SPECIMEN(S) REQUIRED? <input type="checkbox"/> Yes <input type="checkbox"/> No		DATE COLLECTED:*/ / /		RESULTS:*/ 1. _____ 2. _____ 3. _____						
LAB:			WERE CONTROL MEASURES DISCUSSED WITH PATIENT? <input type="checkbox"/> Yes <input type="checkbox"/> No				BY:			
RETURNED TO WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No		DATE:*/ / /		EXPECTED DATE:*/ / /			EXCLUDED FROM HIGH-RISK DUTIES? <input type="checkbox"/> Yes <input type="checkbox"/> No			
SEXUAL PREFERENCE: <input type="checkbox"/> Heterosexual <input type="checkbox"/> Homosexual <input type="checkbox"/> Bisexual <input type="checkbox"/> Unknown <input type="checkbox"/> N/A									MULTIPLE PARTNERS? <input type="checkbox"/> Yes <input type="checkbox"/> No	
RECREATIONAL DRUG USE: <input type="checkbox"/> Yes <input type="checkbox"/> No		DRUGS OF CHOICE:								
*Epi Calendar:										
MONTH(S) / DATES:			YEAR:		DISEASE:			WORK:		
Sunday ____	Monday ____	Tuesday ____	Wednesday ____	Thursday ____	Friday ____	Saturday ____				
Sunday ____	Monday ____	Tuesday ____	Wednesday ____	Thursday ____	Friday ____	Saturday ____				
Sunday ____	Monday ____	Tuesday ____	Wednesday ____	Thursday ____	Friday ____	Saturday ____				
OTHER PERTINENT EPIDEMIOLOGICAL DATA (TO INCLUDE PROBABLE SOURCE):										
INVESTIGATOR: 								DATE COMPLETED:		